



Sorting in
Champagne
c. 1930s

Latest vineyard destemming and sorting technologies

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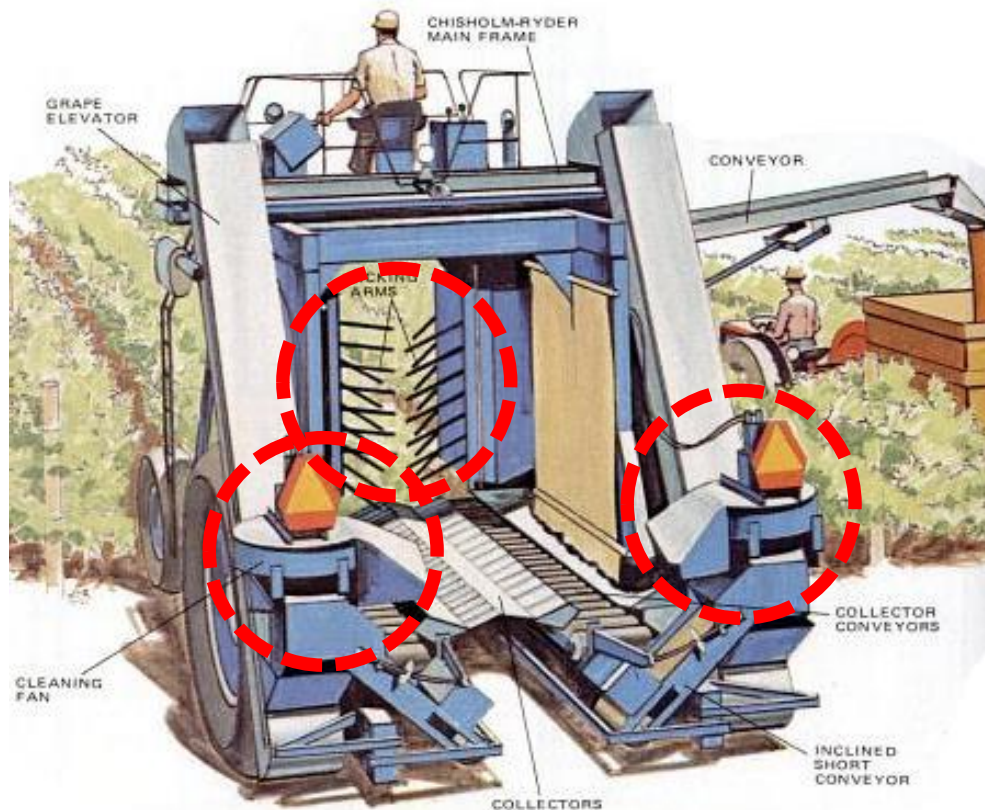
- Destemming: Detaching and removing stems
- Sorting: Removing undesirable grapes, leaves, petioles or other contaminants

Closely related processes that may be performed in the vineyard or winery or both

Machine harvesters - c. 1970s



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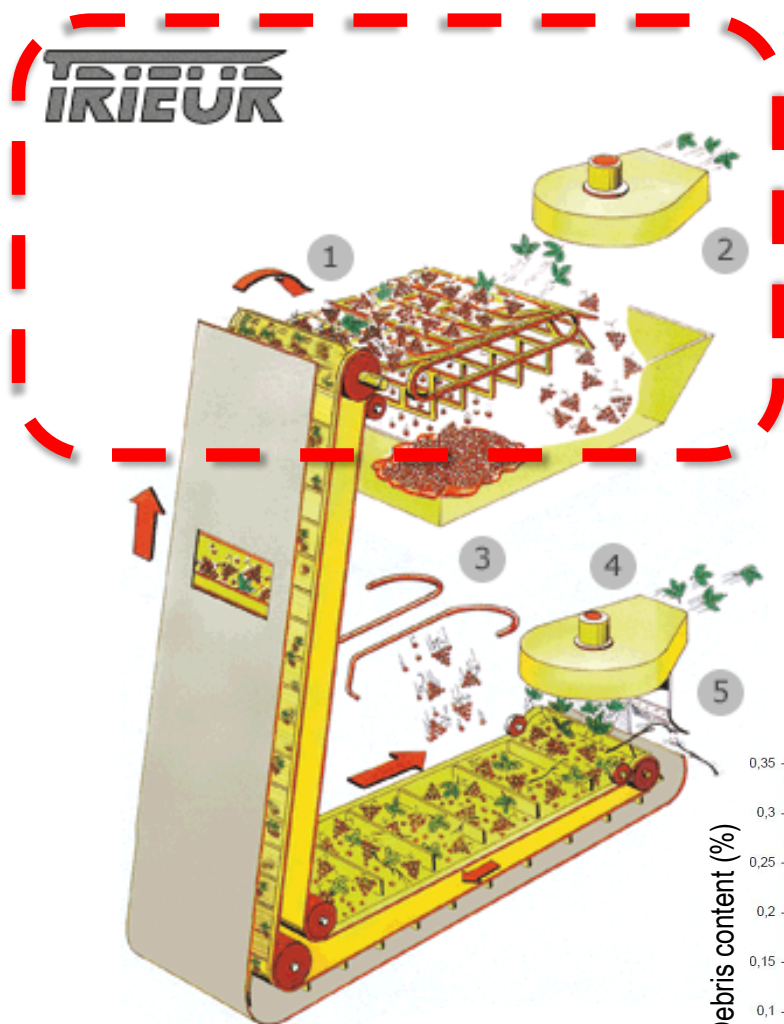


- Partial destemming
 - Many stems left on the vine
- Some sorting
 - Cleaning fans - leaves
- Vegetal matter in harvest
 - Hand-picked: ~7%
 - Machine-harvested: ~1-2%

Pellenc Trieur grid-belt sorter - c. 1999

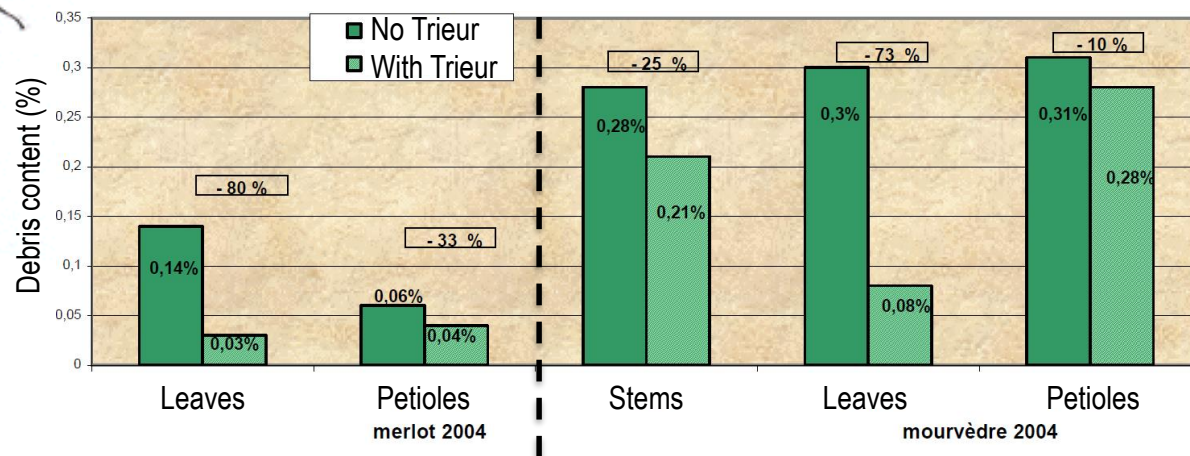


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- Free grapes and juice fall through grid-belt so top fan can clean more effectively / operate at higher suction without losing juice
 - Still mainly just removes leaves
 - Petioles pass / not sucked away

Debris content with and without Trieur top-fan turned on
(Plot translated from Vinsonneau et al. 2005)

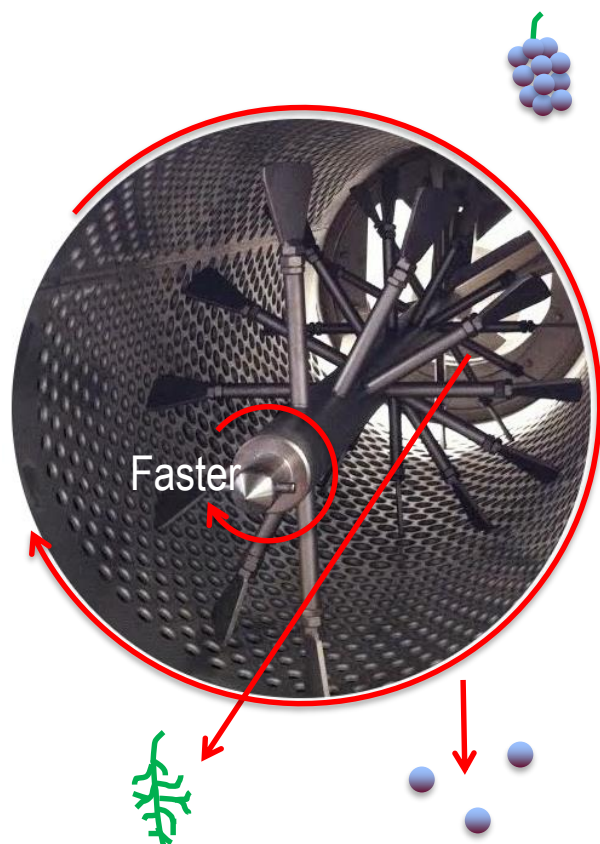


SOCMA linear winery destemmer – c. 1999



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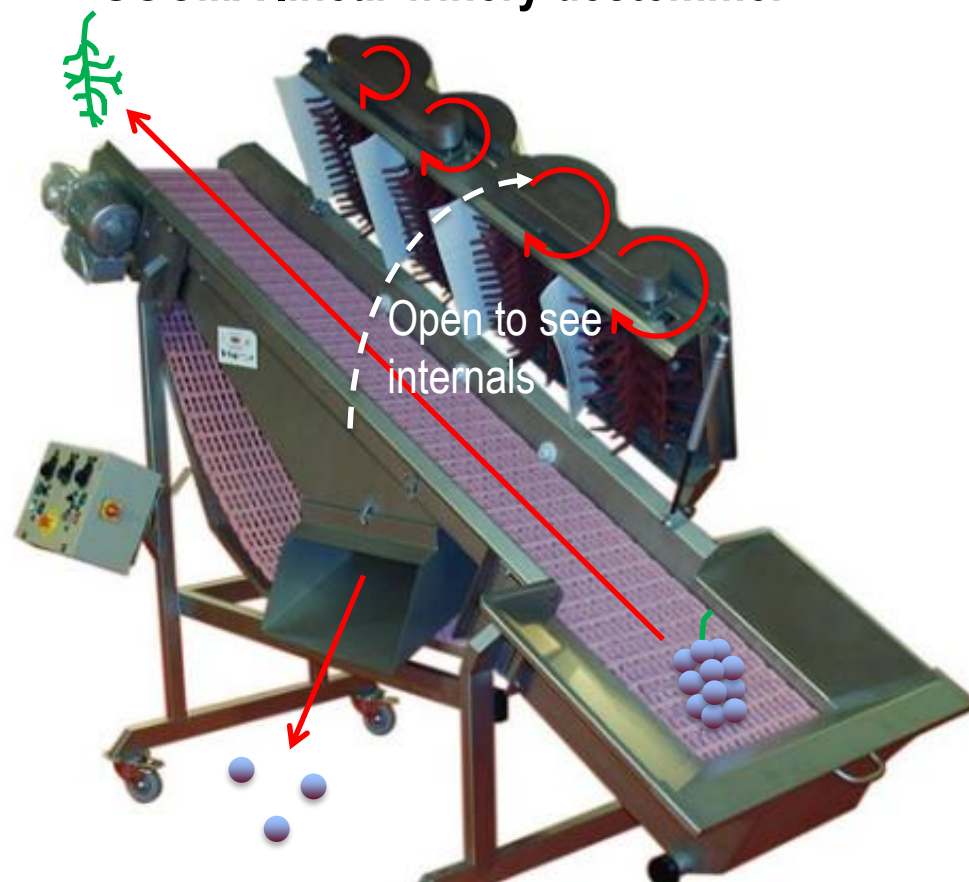
Rotary winery destemmer (traditional)



23% juice

1.5% vegetal matter

SOCMA linear winery destemmer

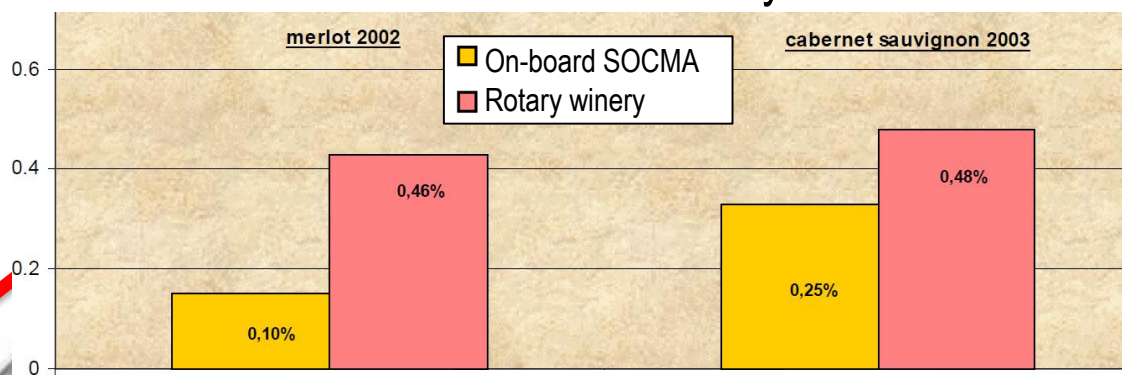


12% juice

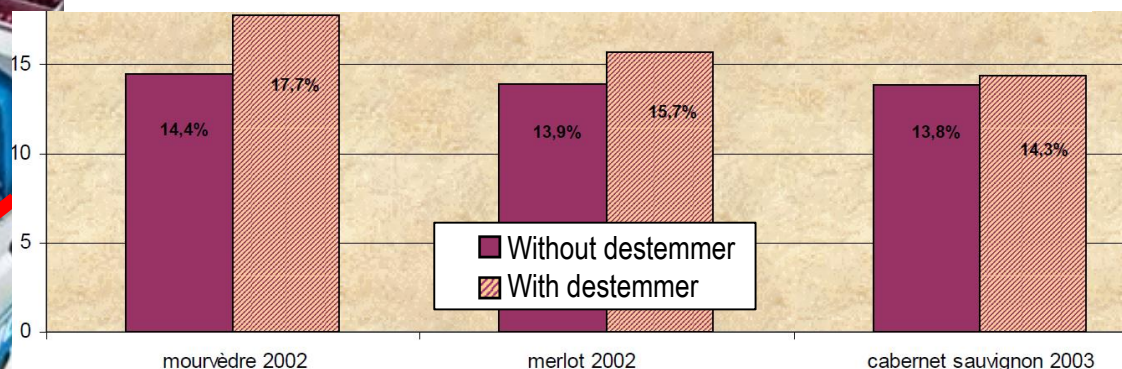
0.9% vegetal matter

- Above bins on each side – still current destemmer for New Holland Braud harvesters
- Removed more vegetal matter than rotary winery destemmer
- Slightly more juicing at harvest than without destemmer

Stem content – on-board SOCMA vs. rotary destemmer at winery



Juice content – without or with on-board destemmer



Pellenc - Selectiv' Process 1 & 2 - c. 2007 & 2013



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- Pellenc's new shaking linear destemmer
- Roller sorting table including initial rollers to align petioles
 - Pellenc claim: "95% of petioles eliminated" (bigger than 35 mm long, IFV testing)

*Feeder fingers
steady flow - limits
fragmentation*

*High-frequency
linear destemmer*



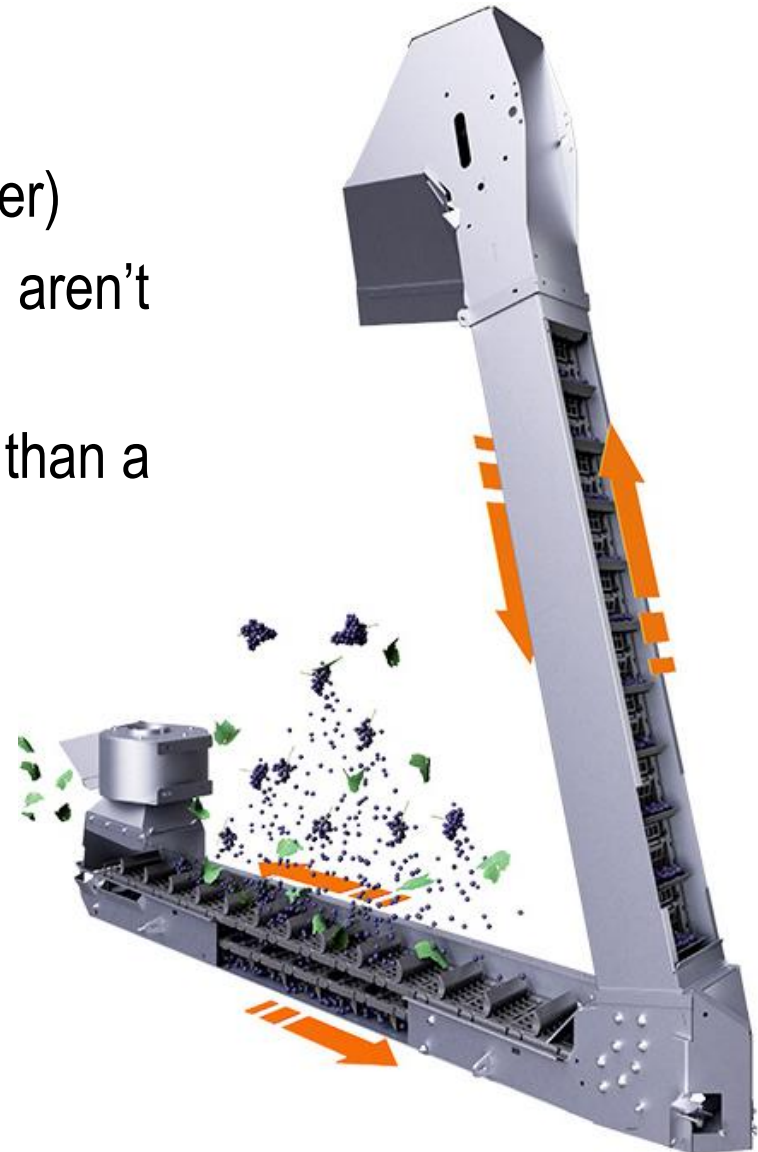
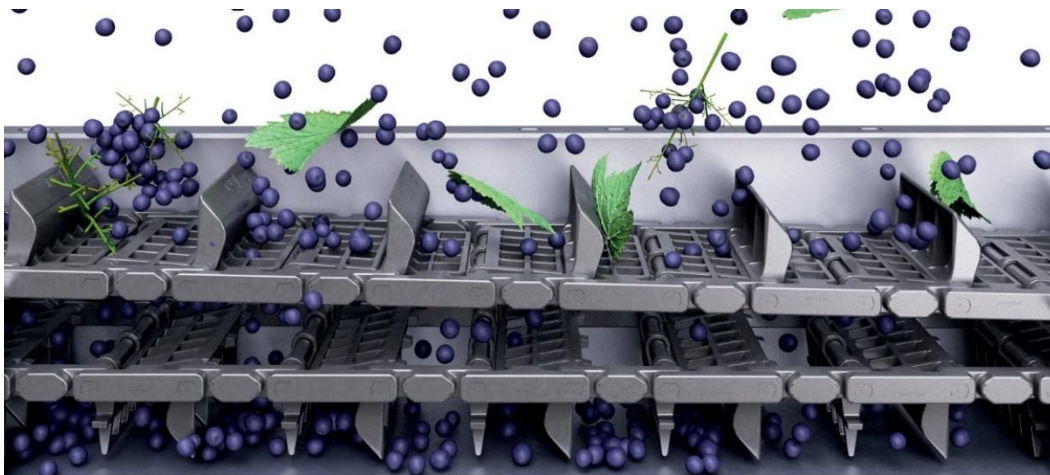
Open conveyor

Pellenc – grid-conveyor sorter



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- Grid for the whole conveyor
(evolution of Pellenc's initial grid fan sorter)
 - Free grapes/juice can fall through and aren't exposed too directly to fans.
 - Pellenc claim “up to 5% more harvest than a competitive machine”



Video - Pellenc Selectiv' Process 2



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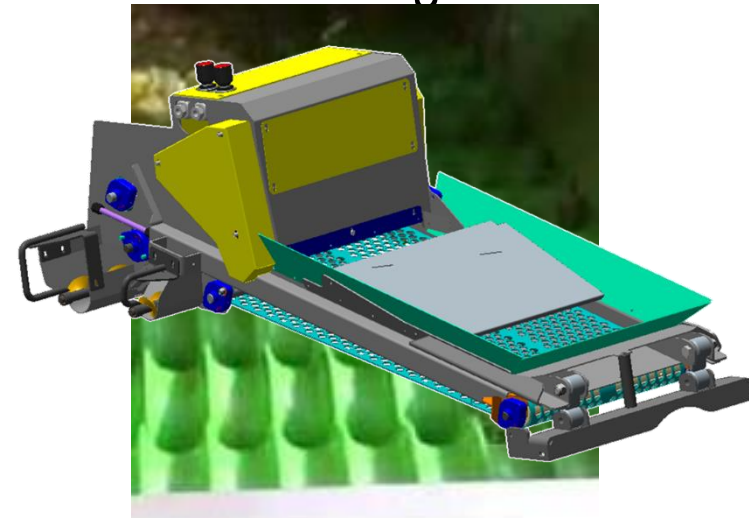
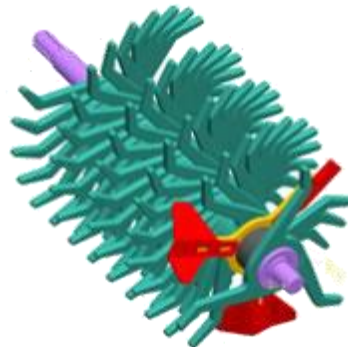
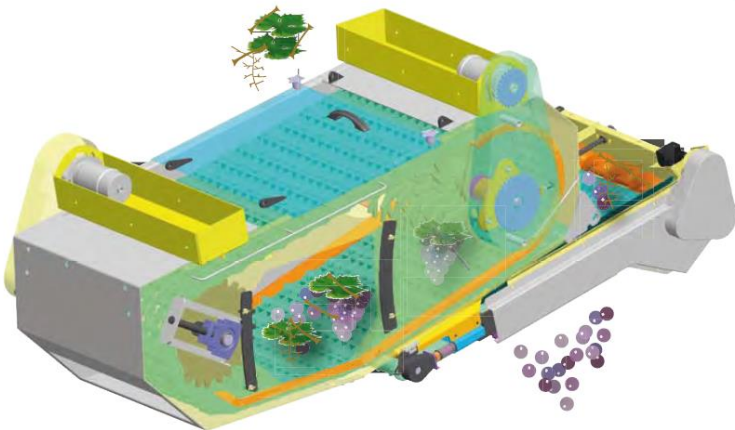
Gregoire Cleantech Vario - c. 2009



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- Gregoire Cleantech destemmer
(cross between SOCMA destemmer
and traditional rotary destemmer)
- Vario roller sorting table
 - In France they have also offered
the ViniSelect holed shaking belt
sorter (low throughput, c. 2013)
instead of roller sorting



Video – Gregoire Cleantech Vario



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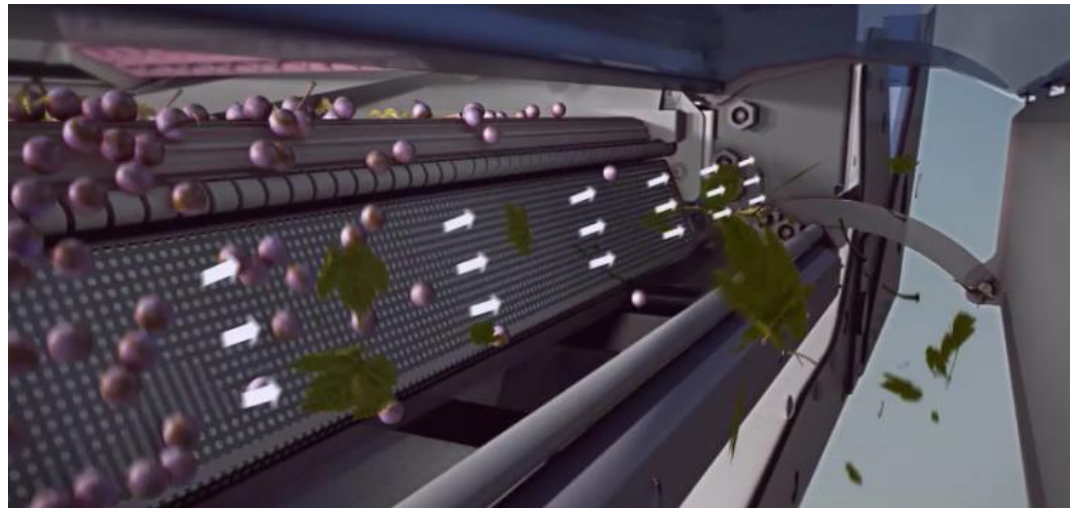
New Holland Braud Opti-Grape - c. 2013



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- Still has SOCMA destemmer
(after a new roller pre-sorting stage)
- Now has an air-cushion sorting stage
 - New Holland claim: “it is also effective at removing dry and mouldy fruit, and also botrytrised fruit”



Video – New Holland Braud Opti-Grape



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ERO Vitiselect - c. 2013



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- Traditional rotary destemmer
(ERO claim that they were first with an on-board destemmer in 1998)
- Roller sorting table
- Compatible with side-arm discharge conveyor



Video – ERO Vitiselect



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Oxbo PremiumSort - c. 2015



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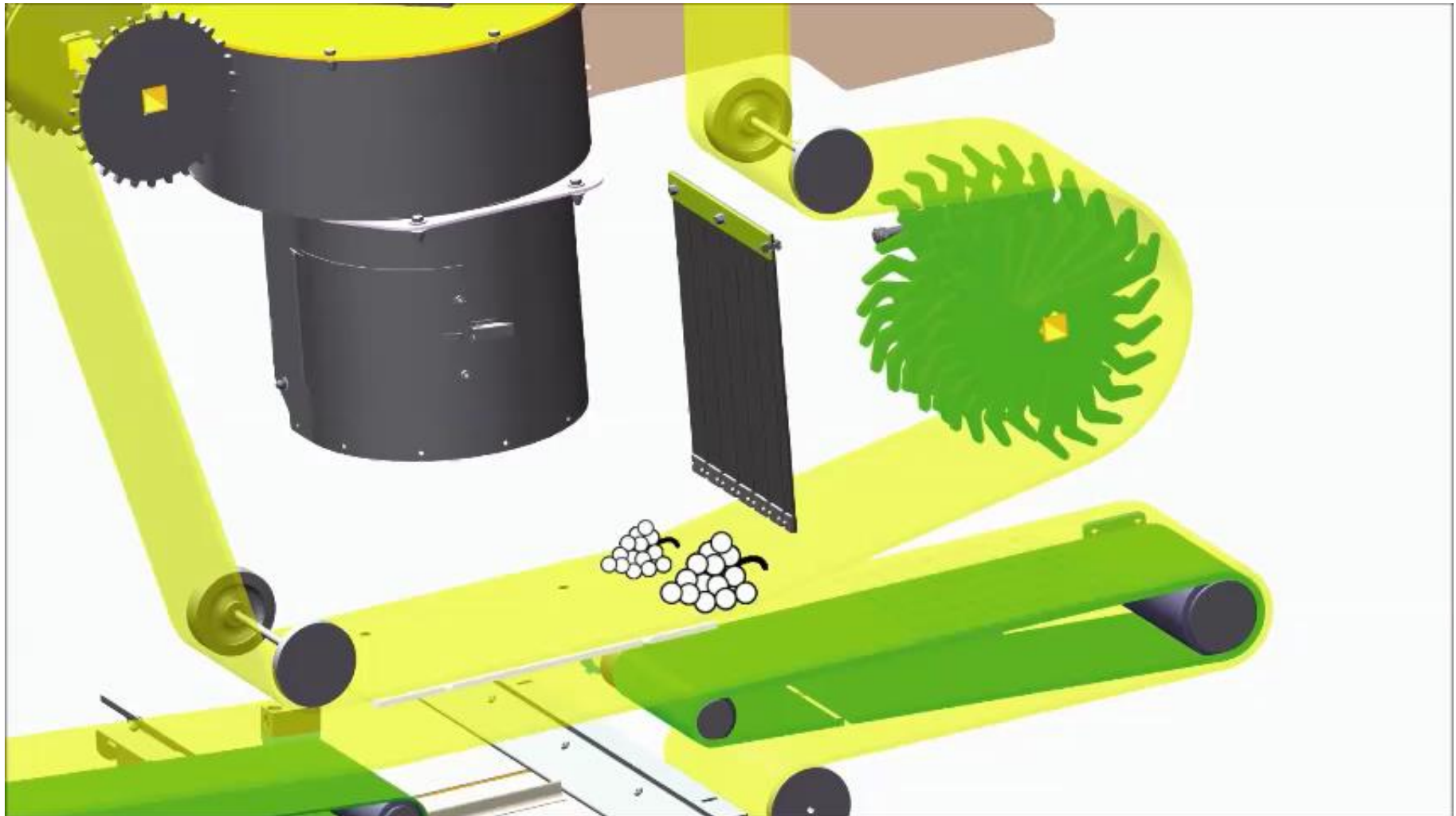
- Destemmer similar to Gregoire but is centrally and rear-mounted
- Ratchet motion sorting belt that grapes fall through
- Compatible with side-arm discharge conveyor



Video – Oxbo PremiumSort



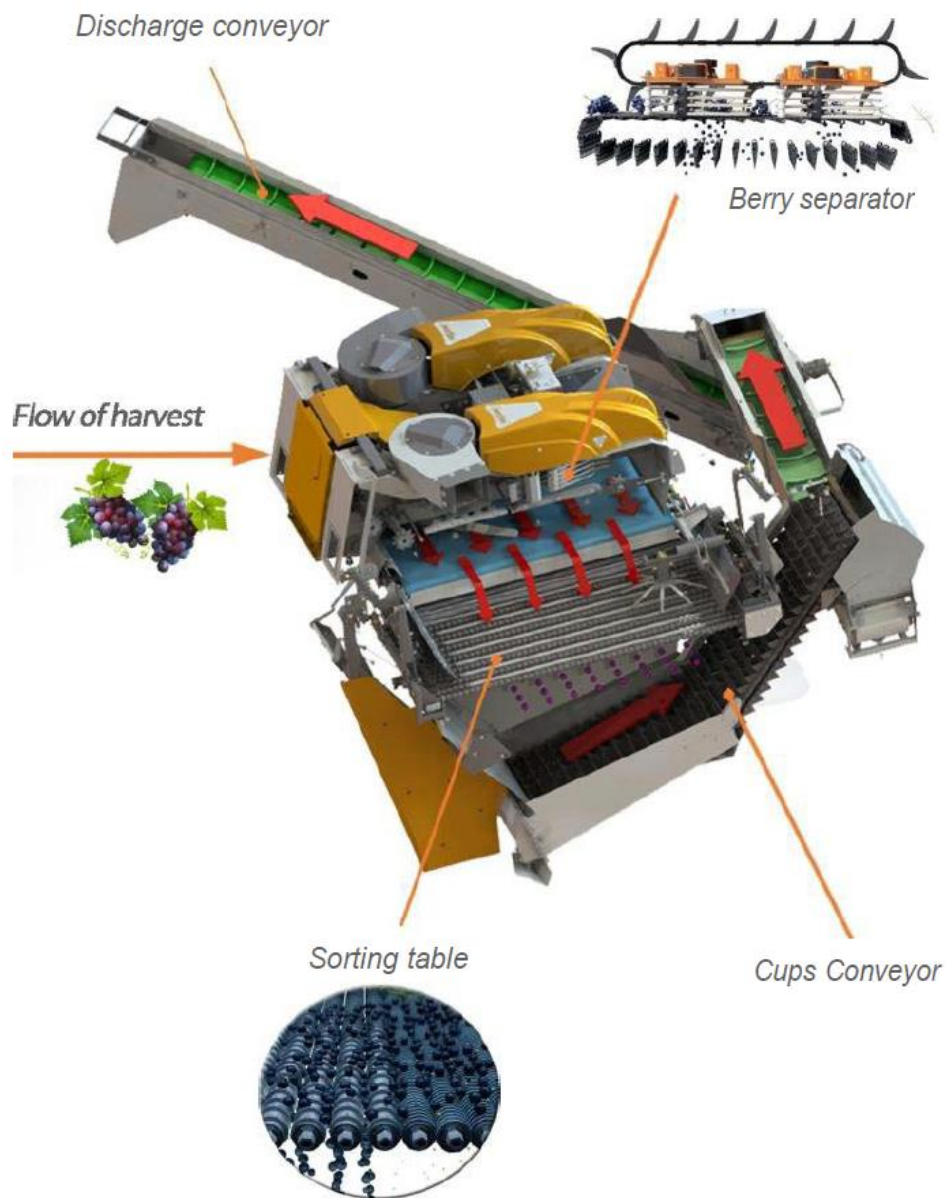
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Pellenc Selectiv' Process 2 (XLE) – conveyor - c. 2015



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- Similar to model with twin on-board bins, but has side-arm discharge conveyor
 - Side-ways moving belt under destemmers transfers grapes to a single larger sorting table
 - Sorted grapes fall into a single buffer bin with a conveyor system in it that feeds the side-arm discharge conveyor
 - Buffer bin allows for storage when changing gondolas, etc.
- Demonstrations in USA and Australia last vintage

Video - Pellenc Selectiv' Process 2 (XLE)



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Speed and yield

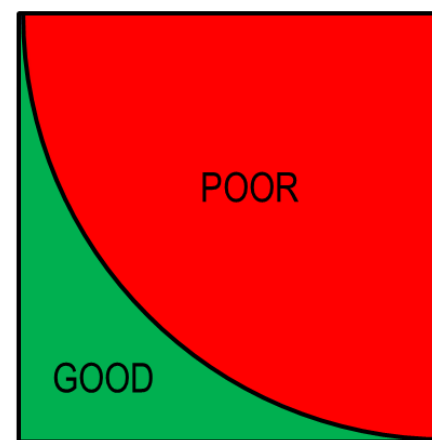


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- Destemming and sorting systems may only process a certain throughput before their performance declines → losses or maceration



Forward
speed (km/h)



Yield (t/ha)

- Limitations model/conditions dependent – only have supplier recommendations (not independent – treat with considerable caution)
 - Pellenc: Destemmers “reach speeds up to 50 tonnes/ha at 4.5 km/hr”
 - New Holland Braud: Destemmer only “use in up to 20 tonnes/ha, shorter rows”
Opti-Grape “use in up to 8 tonnes/ha, shorter rows”



- Destemming and sorting systems add complexity and moving parts
- One company I spoke with loved the harvest quality but experienced a few more breakdowns (will be model and conditions dependent)

Does sorting improve wine quality?

(vineyard
or winery)



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- Complex question, factors include:
 - Grape and vine condition
 - Wine style
- With regards to removal of vegetal matter:
 - More important for reds than whites – most important factor is probably the long contact time during fermentation
 - Vinsonneau and Vergnes (2000): 1% additional vegetal matter can negatively impact quality for some red wines (this was added on top of the 0.5-2.1% that was already in the output from the destemmer)
 - Anneraud et al. (2012) trialled many pieces of winery sorting equipment
 - Before sorting vegetal matter was typically 0.4-1.7% and after was 0.1-0.4%
 - Ward et al. (2015): > 5% petiole addition required to produce significant sensory and chemical changes in a Cabernet Sauvignon (petiole addition increased floral characters)



Destemming/sorting in the vineyard or winery?



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- Red grapes/wine



- If mechanically harvesting and want to sort, probably better to sort on harvester as the grapes will be in the most intact condition for sorting
- One benefit of winery sorting is extra technologies (optical, density bath)

- White grapes/wine



- On-board destemming could cause more grape maceration leading to more grape skin derived phenolics in the free-run (level of maceration will be brand/model/conditions dependent)

Adoption of on-harvester destemming and sorting



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- Currently low adoption in Australia relative to Europe and New Zealand
 - Low industry profitability
 - Vegetal matter left in the vineyard that currently get paid for by weight at the winery (and some good grapes – typically 0.5% in ITV/IFV studies)
 - Slower forward harvesting speeds in some instances
 - Increased maintenance
 - Side-arm discharge conveyor models only available recently
- (the increased operating costs are likely more influential than capital costs – destemming/sorting system only 2-10% extra on \$400K harvester)
- Adoption will likely increase over time

- Suppliers who provided information on their winery/vineyard equipment and offered their perspective
- Wine industry personnel who offered their perspective
- People who posted videos of equipment operation on-line that I used/edited snippets from
- MatéVi – includes information on equipment trials performed by the French Institute of Vine and Wine (IFV)



<http://www.matevi-france.com>

The information contained in these slides should be considered general in nature, and viewers should undertake their own specific investigations before purchasing equipment or making major process changes.

The dates when different inventions were introduced and the order in which these inventions were made are presented in good faith based on information currently available. Some limited comparisons between different equipment are made and these are again presented in good faith based on available information.

It should be noted that there is fairly limited rigorous independent information available on the relative performance of vineyard/winery equipment, particularly given the importance of equipment performance to all wine producers - both in terms of wine quality and productivity.

None of the information presented in this article should be considered as an endorsement of any product by the AWRI.

WHAT DO YOU USE?



Grapegrowing



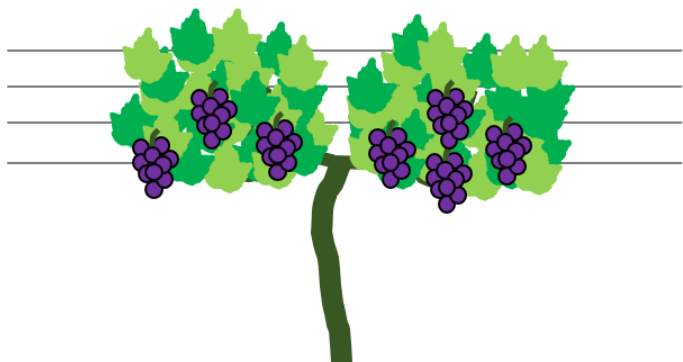
Winemaking

5-Yearly AWRI Technical Survey – Late August 2016



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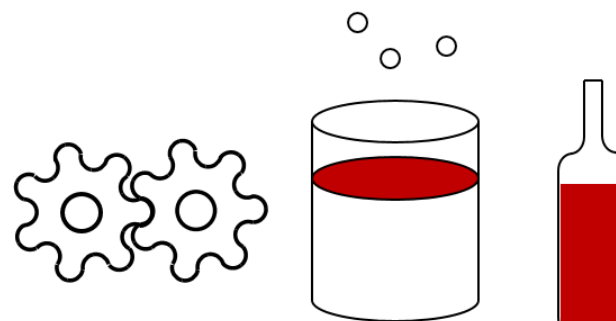
*1 survey per grapegrowing business
per GI region*



Grapegrowing survey



1 survey per winery site



Winery survey

(winery site: site that performs at least
1 of crushing, fermentation or packaging)

VINITECH
❖ SIFEL

Survey respondents will go into the draw to win a trip to
Vintech-Sifel 2016 in Bordeaux – [Terms and conditions](#)